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PRE-APPEAL BRIEF REQUEST FOR REVIEW

PRE-APPEAL BRIEF REQUEST FOR REVIEW	Docket Number (Optional) 05-495
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)] on _____ Signature_____ Typed or printed name _____	**Application Number** 10/538,947 **Filed** June 14, 2005 **First Named Inventor** Geoffrey Spence **Art Unit** 2616 **Examiner** D. Chery

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
     Note: No more than five (5) pages may be provided.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.
(Form PTO/SB/96)

☑ attorney or agent of record. Registration number 32901

☐ attorney or agent acting under 37 CFR 1.34.

Registration number if acting under 37 CFR 1.34 _____

/A. Blair Hughes/
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Signature

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May 24, 2010
_____
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required.
Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

(Case No. 05-495)

In the Application of:)
)
        Geoffrey Spence   )   Examiner: D. Chery
)
Serial No.   10/538,947   )   Group Art Unit: 2616
Filed: June 14, 2005   )
)   Conf. No. 9470
Title: Signal Separation   )

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

PRE-APPEAL REQUEST FOR REVIEW

I.   BACKGROUND

Claims 1-3, 5-6 and 10-21 are pending in the application. Of the pending claims, claims 1 and 14-19 are independent claims.

II.   TRAVERSE OF THE PRIOR ART REJECTIONS

Claims 1-3, 5-6 and 10-21 are pending in the application. The examiner has rejected all application claims for obviousness over Stetson (USP 6,701,170) in view of Lee (USP 6,799,170) or over Lee in view of Stetson.

A.   Stetson in View of Lee – Claims 1-3, 5-6 and 10-17

The examiner rejected claims 1-3, 5-6 and 10-17 under 35 U.S.C. 103 for being obvious over Stetson (US Patent 6,701,170) in view of Lee (U.S. Patent 6,799,170).[1]

1.   All claims are non-obvious and patentable

Regarding independent claims 1, 14 and 16-17, the examiner relies upon Stetson for disclosing the claim 1 step c) feature of:

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[1] There is an error in the examiner's Final Rejection. On page 5, lines 1 to 3 of the Office Action, the examiner states that Stetson discloses "expressing the composite signal as a matrix X having rows each of which is a respective segment of signal amplitude values and corresponds to a length of time associated with a signal cyclet". This statement is contradicted at lines 10-11. It appears that the examiner intended to delete the phrase "having rows each of which is a respective segment of signal amplitude values and corresponds to a length of time associated with a signal cyclet" from page 5 lines 1-3, and the Applicant so assumes.

c)   performing independent component analysis (ICA) of the decomposition results to obtain at least one of estimated separated signal modulation envelopes and estimated separated signal cyclets (Col. 7, lines 32 - 67).

A first reason why all claims are not obvious is because the examiner's position regarding claim step c) is incorrect. Stetson does not "obtain at least one of estimated separated signal modulation envelopes and estimated separated signal cyclets" at Col. 7, lines 32 – 67 or anywhere else. It is important to appreciate that Stetson is carrying out conventional Blind Source (or Signal) Separation, which, as is well known, yields signals which are complete and separated. The Blind Source Separation taught by Stetson does <u>not</u> yield signal attributes and/or parts such as their modulation envelopes or cyclets. (See, e.g, Stetson Col. 8 lines 4-7, which refers to the plethysmographic signal and the interference signal being obtained).

Applicant's claimed invention is <u>not</u> conventional Blind Source Separation. The claimed methods do not recover separated signals. Instead, the methods of claims 1, 14 and 16-17 as well as independent claims 15 and 17 recover signal attributes and/or parts of signals, i.e. modulation envelopes and/or cyclets. To accomplish this, Applicants' invention processes a matrix with rows corresponding to cyclet length, not simply rows which are signal mixtures unrelated to cyclet length as disclosed in Stetson. For at least this reason, claims 1-3, 5-6, and 10-17

Claims 1-3, 5-6, and 10-17 are independently non-obvious because neither reference discloses the step a) feature of "a matrix having rows each of which is a respective segment of signal amplitude values and corresponds to a length of time associated with a signal cyclet". The examiner alleges that Lee teaches a matrix having rows x(t) having values correspond *(sic)* to a length of time with signal cyclet *(sic)*. (Citing Figure 1 & Col. 4, lines 58 – 67) However, the cited Lee excerpt has nothing to do with signal cyclets. Lee Figure 1 is simply a drawing of signal sources, signal sensors and data output from the sensors. Moreover, Lee Col. 4, lines 58 – 67 merely discusses the numbers of sources and sensors, stating that ICA works there are at least as many sensors as sources, but not if there are fewer.

2.   Claims 15 and 17 are independently patentable

Independent claims 15 and 17 are independently non-obvious because the cited prior art does not disclose source signals having periodicities similar or equal to p as claimed. The examiner points to Stetson Figure 3 for reciting this feature. However, in Stetson Figure 3, each signal has two very different periodicities for a low amplitude region and a high amplitude

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region, approximately 50 time units and 20 time units respectively - so one is 150% bigger than the other. The examiner's reference to Col. 6, lines 45 – 50 for disclosing this feature is not understood as the cited excerpt relates to a photocurrent graph, not to a computer or software.

Claims 15 and 17 are also non-obvious because the cited prior art does not disclose claim step (a) of partitioning a composite signal into a plurality of partition matrices having rows each of which is a respective segment of signal amplitude values and corresponds to a length of time associated with a signal cyclet for the same reasons recited in Section II(A)(1) above.

Moreover, because Stetson Col. 5, lines 20 – 26 does not disclose partitioning a composite signal into a plurality of partition matrices as above, it does cannot disclose performing an SVD of at least one such matrix as required by claims 15 and 17. Col. 6, lines 64 – 67 of Stetson merely discloses SVD of conventional data.

B. Lee in View of Stetson – Claims 18-21

Claims 18 -21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Stetson. The examiner's rejection of claim is traversed on a variety of grounds. Regarding the independent claim 18 preamble, Lee does not disclose each source signal having a respective period similar or equal to p. Figures 9A and 9B are speech signals from different microphones monitoring a conversation, and the periodicity clearly varies considerably as voices change in pitch. Regarding claim 19, the examiner states that Lee discloses a method (Figure 1) of separating a plurality of source signals (121,122,102 etc) from a composite signal (101) expressed as a series of values of signal amplitude. This is wrong – 101 and 102 are sources, and 121 and122 are sensors (also 123) (See Col. 4 lines 45-49). The examiner goes on to state that each source signal having a respective period similar or equal to p, which is also wrong as Lee Col. 5, lines 6-12 discloses monitoring human voices which vary will considerably in pitch and will not have a common cyclet period, so Lee teaches away from such a period.

Claims 18-21 are also non-obvious because the cited prior art does not disclose the independent claim 18 and 19 feature of expressing the composite signal as a matrix having rows each of which is a respective segment of signal amplitude values and corresponds to a length of time associated with a signal cyclet. Lee Col. 4, line 58 - Col. 5, line 35 does disclose numbers of sources and sensors, a series of observations of the sources by the sensors – e.g. monitoring human voices using microphones, and collecting digital data vectors from the observations.

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However, Lee is concerned with variable pitch, and therefore different cyclet lengths in a data matrix to be processed to separate signals. The portion of Lee cited for disclosing this claim feature - Col. 4, line 58 - Col. 5, line 35 - discloses numbers of sources and sensors, a series of observations of the sources by the sensors – e.g. monitoring with microphones, and collecting digital data vectors from the observations – but not the claim feature identified above.

Claim 18 is further non-obvious because the cited prior art does not disclose ICA of SVD results from a maximum probability trial matrix with a signal cyclet of trial period p' taken to be the period p subject to this period not corresponding to a multiple of a true period as per 18(d). This is because the cited Lee excerpt (col. 5, lines 47 -67) only describes a conventional ICA method performed on signal mixtures in the normal way (col. 5 lines 37-39).

Claim 18 is also non-obvious because the cited prior art does not disclose SVD of a trial matrix having rows corresponding to a length of time associated with a signal cyclet (see step 18(a)) and also having a probability associated with its decomposition.[2] This is because the Stetson excerpt cited for disclosing this feature (col. 6, line 64 - Col. 7, line 12) simply discloses obtaining two principal components for data from two wavelengths.

Claims 19-21 are also non-obvious because the cited prior art also does not disclose the claim 19(c) feature of estimating a number q of source signals with periodicities similar or equal to p present within the composite signal and reducing the decomposition results in accordance with such number. The cited Lee excerpt - Col. 4, lines 58 -67 - discloses estimating the number of sources to determine whether or not ICA will work, because ICA requires at least as many sensors as sources. Cleary the cited Lee excerpt has nothing whatsoever to do with estimating the number of source signals with similar periodicities present within the composite signal, or with reducing the decomposition results in accordance with such number.

Claims 19-21 are also non-obvious because the cited prior art also does not disclose "performing independent component analysis (ICA) of the decomposition results to obtain at least one of estimated separated signal modulation envelopes and estimated separated signal cyclets" of claim 19 step (d). Lee Col. 5, lines 47 -67, which is cited for teaching this feature, actually discloses conventional ICA of a series of observations.

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[2] The examiner's reference to Stetson Col. 3, lines 28-33 is not understood. This extract relates to "minimizing a function of the higher-order cross-correlation of the data" – here a higher-order cross-correlation is not a decomposition-associated probability and "the data" is not a trial matrix with cyclet-related rows.

Claims 19-21 are also non-obvious because the cited prior art does not disclose or suggest decomposition of a matrix having rows corresponding to a length of time associated with a signal cyclet (see 19(a)). The examiner acknowledges that Lee does not disclose step (b), and relies instead on Stetson Col. 6, lines 64 -67 for supplying the missing teaching. The examiner's reliance on Stetson in misplaced because the cited excerpt simply discloses obtaining two principal components for data from two wavelengths.

Claims 20-21 are independently non-obvious and patentable. Regarding claim 20, the cited excerpt of Lee at Col. 4, lines 58-67 does not mention signal periodicity or any related quantity. Regarding claim 21, the cited Lee excerpt - Col. 13, lines 30-39 - does not mention signal periodicity, a matrix, or any related quantity. Instead, it mentions little more than class probabilities, sample block size, ICA and signal to noise ratio.

C.   The Combination of References is not Rational or Logical

All claims are non-obvious because the combination of Lee and Stetson – or vice versa – is illogical. According to MPEP §§ 2142 and 2143, it is the examiner's burden to establish a *prima facie* case of obviousness by clearly articulating reasons with rational factual underpinnings to support the conclusion of obviousness. This includes establishing rational reasons for combining prior art references. Stetson and Lee are not properly combined at least because one of skill in the art at the time of the invention would understand that the references relate to incompatible techniques and circumstances. Stetson relates to conventional Blind Source Separation using independent component analysis (ICA). (See e.g. Col. 7 lines 32-35). Lee relates to methods used when ICA does not work. (See Col. 5 lines 62-67, stating that ICA does not work if the sources are not independent or if they move location). Thus, one skilled in the art at the time of the invention would understand that Stetson and Lee disclose methods that are used in different situations – Stetson where ICA is workable and Lee where ICA is not workable. All claims, therefore, are not obvious because the combination of the references would not have been made by one skilled in the art at the time of the invention.

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